it is, in the absence of *authentic* examples, and there being some features in which the descriptions of the two species do not quite harmonize, I feel justified in retaining my opinion as to their difference. *D. nitida* of Verrill, as judged by the Museum examples, it certainly is not. The latter is probably the same as the unnamed fragments I mentioned in my paper as being in the Museum collection. I have not as yet seen a second example of *D. Brasseyi*; but in Lady Brassey's collection are several specimens of *D. Allnutti*, some fronds being very large, much more so than is given by Mr. Tenison-Woods.

I am, Gentlemen,
Yours obediently,
BRYCE WRIGHT.

204 Regent Street, W.
Feb. 18, 1884.

BIBLIOGRAPHICAL NOTICE.

Catalogue of the Fossil Sponges in the Geological Department of the British Museum (Natural History); with Descriptions of new and little-known Species. By GEORGE JENNINGS HINDE, Ph.D., F.G.S. 4to. London: printed by order of the Trustees. 1883.

THERE is certainly no group of organisms that has presented so many difficulties to naturalists as the Sponges. The very kingdom of nature to which they belonged was long a matter of dispute; indeed, not much more than thirty years ago so good a naturalist as Carl Vogt, after briefly discussing their peculiarities, decided that they were at least quite as much plants as animals, and showed that he thought they were less animals than plants by leaving them out of his 'Zoologische Briefe.' Even since their recognition as members of the animal series they have been subjected to vicissitudes such as have fallen to the lot of no other group: after passing for a time as undoubted Protozoa, they were raised by Leuckart and Häckel on embryological grounds to the rank of Metazoa, and finally ranked by Saville Kent as Flagellate Infusoria, while Balfour was inclined to regard them as forming a group in some respects intermediate between Protozoa and Metazoa.

With organisms as to the absolute nature of which such divergent opinions prevailed, with such complete uncertainty with regard even to what constitutes the individual "persona," it is no great matter of wonder that the views of zoologists upon their classification and as to the characters which ought to be employed to distinguish them were irreconcilably diverse, and that for many years spongologists were occupied chiefly with investigations which could only be re-

garded as tentative. Gradually, however, some order began to be evolved out of the chaos. Bowerbank, Gray, and Carter in this country, Oscar Schmidt and others in Germany, proposed systems of classification, in which, although they could not be maintained in their entirety, certain well-marked groups were indicated; and the recognition of these, coupled with the great mass of information accumulated by these authors, paved the way towards an intelligible systematic treatment of the class of Sponges.

If there was all this difficulty in dealing with the recent forms, it is not surprising that the fossil sponges were treated after a very conventional fashion. The characters derived from the constitution of the skeleton, upon which it was shown more and more that we must chiefly rely in determining the nature and affinities of these organisms, were often lost or rendered exceedingly difficult of recognition by the process of fossilization, and palæontologists until quite recently founded their genera and species almost wholly upon the general form and other surface-characters of the fossils. By this means in some instances allied forms were roughly brought together in a manner which might suffice for stratigraphical purposes; but in all other respects our knowledge of the fossil sponges was most unsatisfactory. A few species and genera had been described by various authors with reference to their skeletal and other structural characters, but no respectable attempt to construct a classification of fossil sponges was made until the publication of Prof. Zittel's admirable "Studien über fossile Spongien" in the Memoirs of the Bavarian Academy for 1877 and 1878. That author having taken up the study of the fossil sponges as far as possible on the same principles as are applied to the recent forms, with a view to the preparation of his 'Handbuch der Paläontologie,' a portion of which has made its appearance, was led to the establishment of a remarkably broad and simple classification, which at once took its place as the certain foundation for all future work in this department of palæontology.

Some three years ago Dr. G. J. Hinde was applied to by the Keeper of the Geological Department of the British Museum to undertake the preparation of a Catalogue of the Fossil Sponges in the national collection. Already well known as a careful worker in several branches of what Ehrenberg denominated "Microgeology," Dr. Hinde had been attracted to Munich by the publication of Prof. Zittel's memoirs above referred to, and had remained at Munich for a considerable time, availing himself of the instructions of Prof. Zittel and of the magnificent series of preparations of sponges, recent and fossil, which that gentleman had collected during the progress of his own researches. Dr. Hinde's qualifications for the task offered to him, both natural and acquired, were therefore of the highest order; and we are not surprised to learn that under these circumstances the original rather scanty design was in course of time expanded into the much more satisfactory form of which the present volume is the result. The first idea was that of arranging the fossil sponges in the Museum systematically, "and preparing a

simple catalogue of their specific names and references;" but examination of the collection soon showed that "numerous specimens, more particularly those from British strata, were either quite new to science or had been described and figured in such an imperfect manner that their real characters were unknown." Accordingly "with the consent of the Trustees, it was decided to enlarge the plan and embrace in the Catalogue condensed descriptions of all the species from British strata and of the new species from foreign localities, with figures of all the new forms as well as of those which had been either inadequately figured previously, or of which it was desirable to illustrate the minute structure." Looking at the result, we think that all parties are to be congratulated upon the course that was pursued in this case,—the Trustees for the enlightened liberality which led them to accede to the increased expenditure required, the Keeper of the Geological Department for the valuable work done in the collection under his charge, and the credit attaching to his department through the production of a most valuable contribution to palæontological literature, and the author upon the satisfactory conclusion of his three years' labour and the magnificent style in which his work has been brought out. Nor must we omit to congratulate the working palæontologist upon the acquisition of such a valuable help to the study of perhaps the most difficult group of fossil organisms.

In his treatment of the systematic part of his work, the catalogue proper, the author, as might be expected, follows implicitly the classification of Prof. Zittel, which, as he says, is "the only one, in fact, which is at all applicable." The sponges are referred to the same orders and the same families, and for the most part to the same genera, as by Zittel; but, especially among the British forms, the author has met with many which he was unable to place in any extant genera, and for these new generic groups are proposed. That he has not exercised this power of genus-making recklessly, however, is shown by the fact that out of 139 genera cited only 18 are characterized as new, a degree of reticence which is truly praiseworthy in an author who has had through his hands a mass of specimens referred to over 400 species of organisms so obscure and difficult of investigation that few will have the courage or even the opportunity of criticizing his work. To save space the genera of former writers are not characterized, except in those few cases in which Dr. Hinde has departed more or less from Prof. Zittel's views, so that, so far as the characters of the genera are concerned, the student will have to supplement this catalogue with Zittel's 'Studien' (a translation of which appeared in this journal at the time of their appearance *), or with the abridgment of that work in the 'Neues Jahrbuch,' reprinted and issued separately in 1879 under the title of 'Beiträge zur Systematik der fossilen Spongien.' It is, we think, to be regretted that the short characters of orders, suborders, families, and genera contained in the last-mentioned work were not translated or abridged and given under the respective

* Ser. 4, vol. xx., and ser. 5, vols. ii. and iii. (1877–79).

groups; twenty more pages would have sufficed for this, and the usefulness of the book to students would have been immensely increased.

Out of the 248 pages of which this volume is composed, the actual catalogue of species, including the descriptions, occupies 193; the remainder is devoted to a brief introductory chapter, a tabular and a stratigraphical list of species, a bibliography, and a copious index. The introduction treats very briefly of a few general matters connected with fossil sponges and their mode of occurrence, and deals especially with those curious phenomena of fossilization involving the replacement of silica by carbonate of lime and *vice versâ*, about which there has been considerable discussion of late years. This introductory portion concludes with a few remarks upon the geological distribution of sponges, and on the classification of the fossil forms, with a classified list of the orders, families, and genera referred to in the body of the work. The tabular list of species, in which those occurring in Britain are specially indicated by an appended asterisk, shows in vertical columns the distribution of the species in the broader divisions of geological time; while the stratigraphical list displays the same series of facts arranged from a geological point of view. This latter list brings into prominence a remarkable point, namely, that the earliest sponges of all, the Cambrian *Protospongia fenestrata* and the three species recorded from Dr. Hicks's Ordovian strata, all belong to the Hexactinellidæ, which have commonly been regarded as the most complex of sponges. Further it would appear that while the Cretaceous deposits swarm with the remains of these organisms, they are represented far more scantily in the Tertiary deposits. The British Museum collection possesses only some forms of *Cliona* from the Tertiaries.

We trust that it will be very clearly seen from this short notice that Dr. Hinde, in this Catalogue, has furnished his *confrères* with a most valuable treatise; in fact, with this work and those of Prof. Zittel already referred to, the Sponges, from a literary point of view, may be regarded as perhaps the most favoured group of fossil organisms. But we have yet to say a few words about the plates with which the volume is illustrated, as these contribute in no small degree to its usefulness and importance. There are no fewer than thirty-eight of these plates, and they are for the most part beautifully executed, showing in a most characteristic fashion the external appearance of the fossils, with many of which one is tolerably familiar, and also the spicular and other structural characters known chiefly to students of the group. These illustrations, which by their beauty and number admirably illustrate the text and help to render this the finest palæontological treatise that has issued from the English press for many years, reflect the highest credit upon the artists concerned in their production—a credit, however, which they must be content to share with the author, as in such a case as this we may be pretty sure that without the most careful superintendence on his part, such excellent results as we here meet with could not have been attained.